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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/651,998	08/31/2000	Lingyi A Zheng	M4065.0315/P315	2931

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EXAMINER

TSAI, H JEY

ART UNIT PAPER NUMBER

2812

DATE MAILED: 11/30/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application N .

09/651,998

Applicant(s)

ZHENG ET AL.

Examiner

H. Jey Tsai

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 06 September 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-95 is/are pending in the application.
- 4a) Of the above claim(s) 60-95 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-59 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 18) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: \_\_\_\_\_

Art Unit: 2812

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-59 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cho 6,096,592 or Kamiyama 5,254,505 in view of Miner et al. 6,114,258 and Schuegraf et al. 5,624,865, all are previously applied.

The reference(s) teach the features :

Cho substantially discloses a method of forming a capacitor on the semiconductor device, which includes :

forming a first capacitor conductive electrode 46, fig. 1+,  
forming a dielectric layer 48,  
contacting dielectric layer 48 with a mixture of hydrogen and at least oxygen and nitrous gases (N<sub>2</sub>O), col. 4, lines 51+,  
forming a second conductive capacitor electrode layer 52.

Kamiyama substantially discloses a method of forming a capacitor on the semiconductor device, which includes :

forming a first capacitor conductive electrode 35, fig. 4A+,  
forming a dielectric layer 37,

Art Unit: 2812

contacting dielectric layer 37 with a mixture of hydrogen, oxygen and nitrous gases ( $N_2O$ ), see col. 5, lines 6, lines 32+ and claims 1-2,

forming a second conductive capacitor electrode layer 38.

The difference between the reference(s) and the claims are as follows:

Cho et al. lack a nitride layer. However, Miner et al. teaches forming a nitride layer 110 then introducing a mixture of hydrogen, oxygen and nitrous gases ( $N_2O$ ) in col. 5, lines 7+. Schuegraf et al. teaches forming a nitride layer 64 then introducing a mixture of hydrogen, oxygen and nitrous gases ( $N_2O$ ) in col. 6, lines 43+.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified Cho et al.'s process with a nitride layer as suggested by Miner et al. because nitride is an alternative dielectric layer to form a capacitor.

Applicant's arguments filed on Sept. 6, 2001 have been fully considered but they are not persuasive..

Applicants contend that none of references taken alone or in combination, teach or suggest that hydrogen, oxygen and nitrous oxide gases contact a dielectric layer so as to form an oxidation layer thereon. This is not found to be persuasive

Art Unit: 2812

because Cho clearly teaches contacting dielectric layer 48 with a mixture of hydrogen and at least oxygen and nitrous gases ( $N_2O$ ), col. 4, lines 51+. And, Kamiyama also clearly teaches contacting dielectric layer 37 with a mixture of hydrogen, oxygen and nitrous gases ( $N_2O$ ), see col. 5, lines 6, lines 32+ and claims 1-2.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry of a general nature or clerical matters or relating to the status of this application or proceeding should be directed to the Group customer service whose telephone number is (703) 306-3329 and Fax number (703) 306-5515. Group receptionist telephone number 703-308-0956.

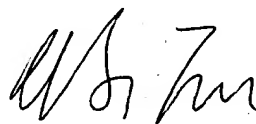
Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. Jey

Art Unit: 2812

Tsai whose telephone number is (703) 308-1374. The examiner can normally be reached on from 7:00 Am to 4:00 Pm., Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on (703) 308-3325. The fax phone number for this Group is (703) 305-3431.

hjt  
11/14/01



H. Jey Tsai  
Primary Examiner  
Patent Examining Group 2800